🏨 Hotel Booking Analysis Dashboard

End-to-end analysis & cancellation prediction — Random Forest

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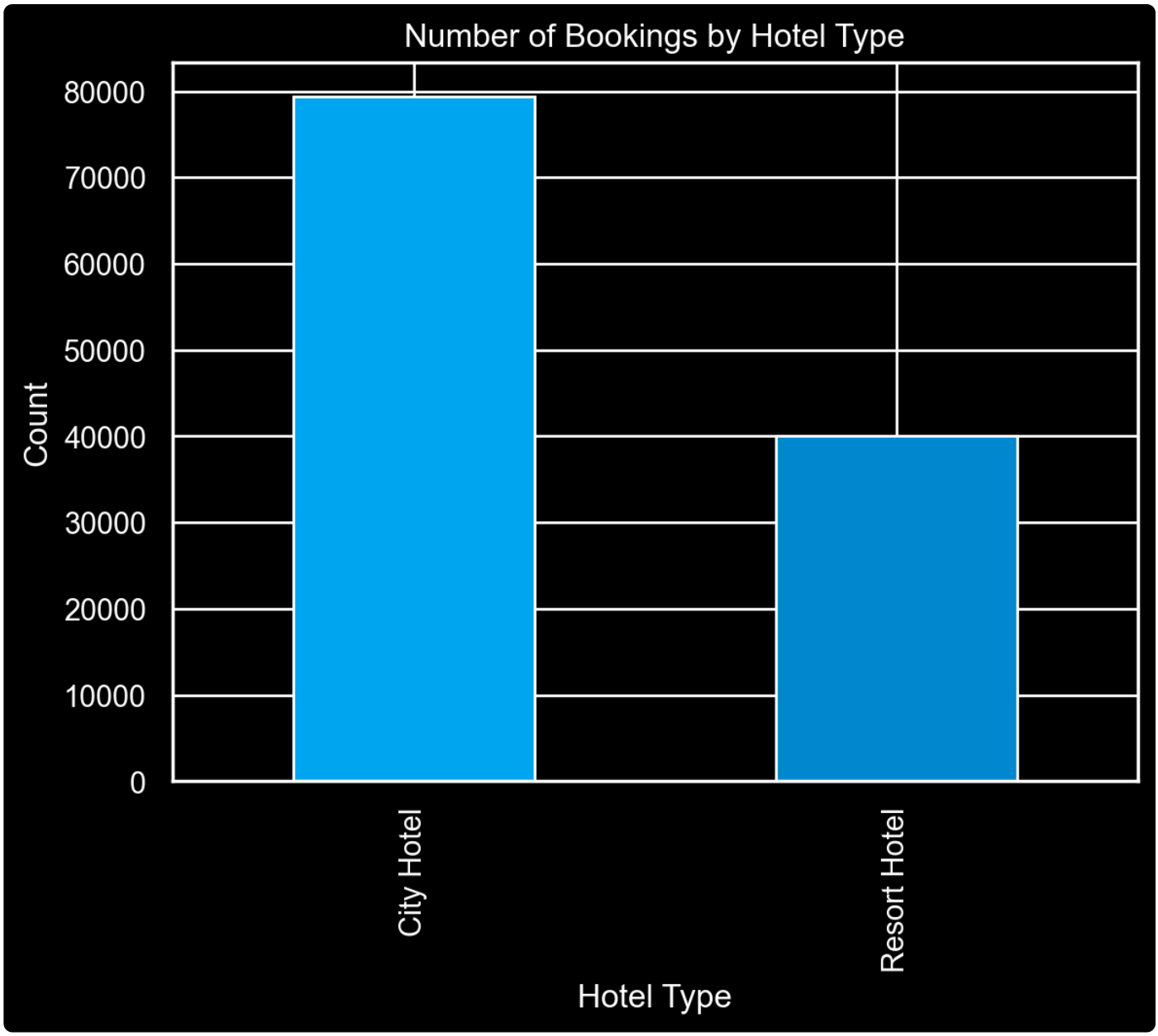
📋 Dataset Overview

Rows: 119390 | Columns: 33

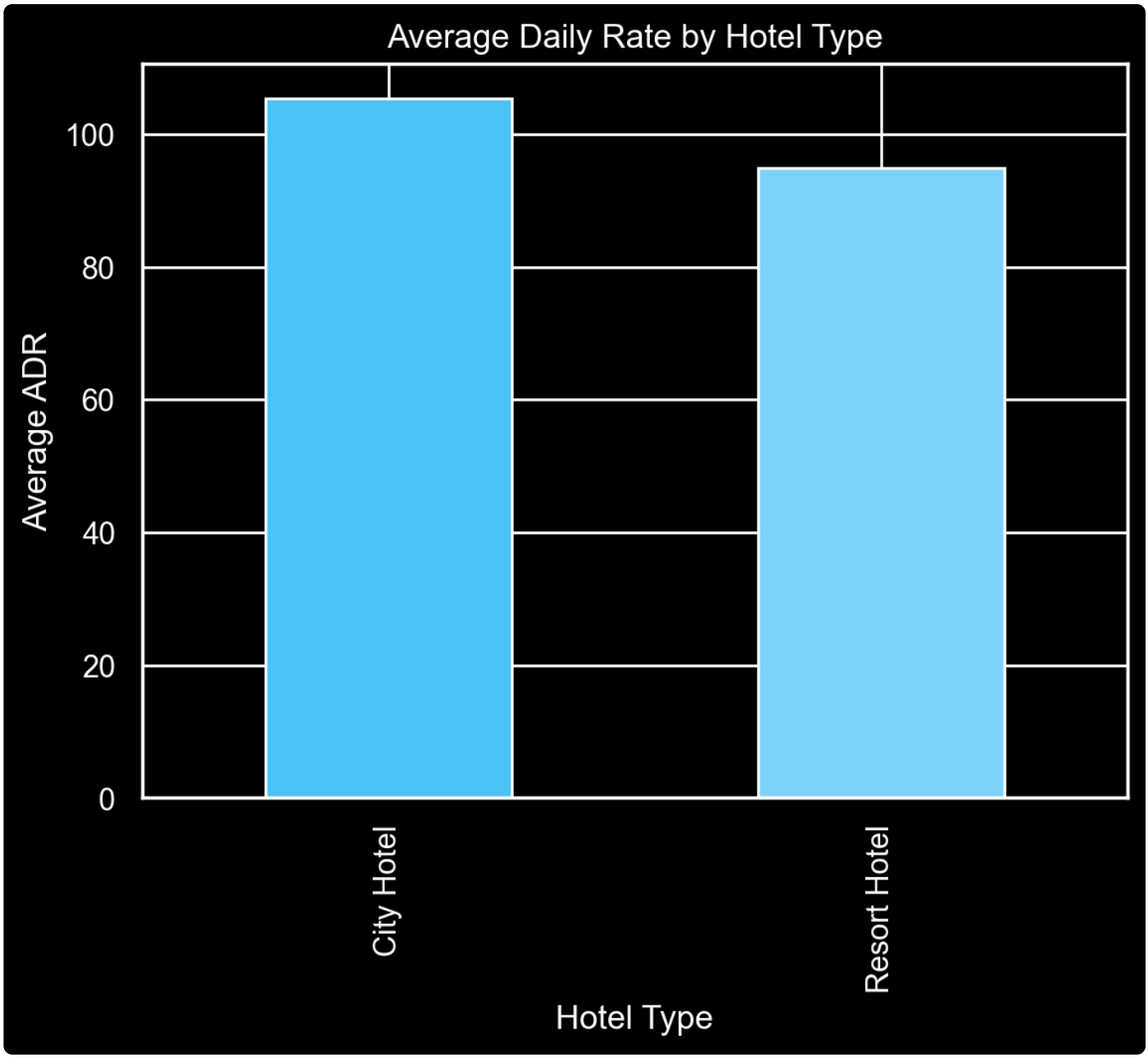
	hotel	is_canceled	lead_time	arrival_date_year	arrival_date_month	arrival_date_week_number	arrival_date_day_of_month	stays_in_weekend_night
0	Resort Hotel	0	342	2015	July	27	1	
1	Resort Hotel	0	737	2015	July	27	1	
2	Resort Hotel	0	7	2015	July	27	1	

📊 Data Visualizations (Matplotlib)

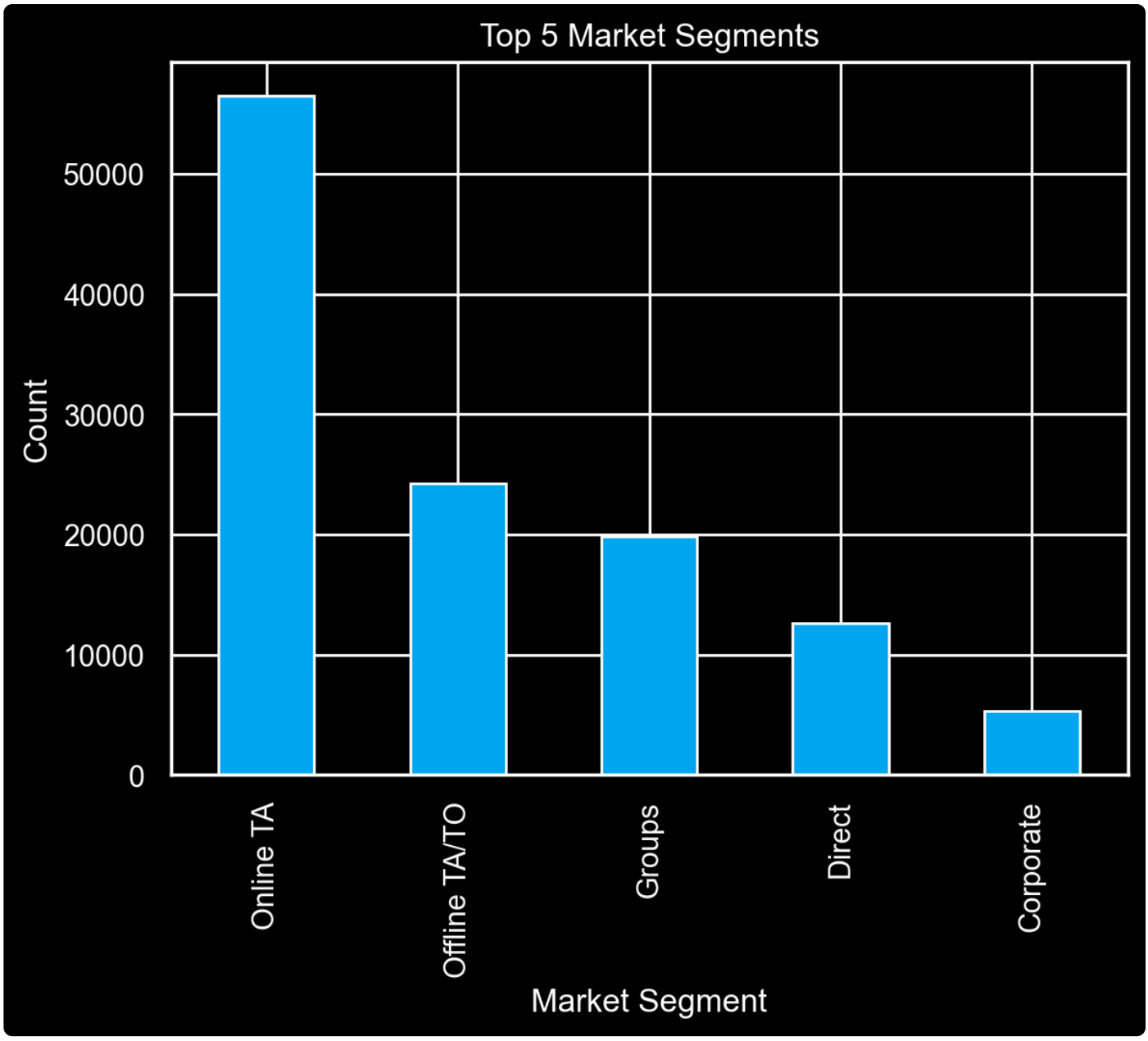
1. Number of Bookings by Hotel Type



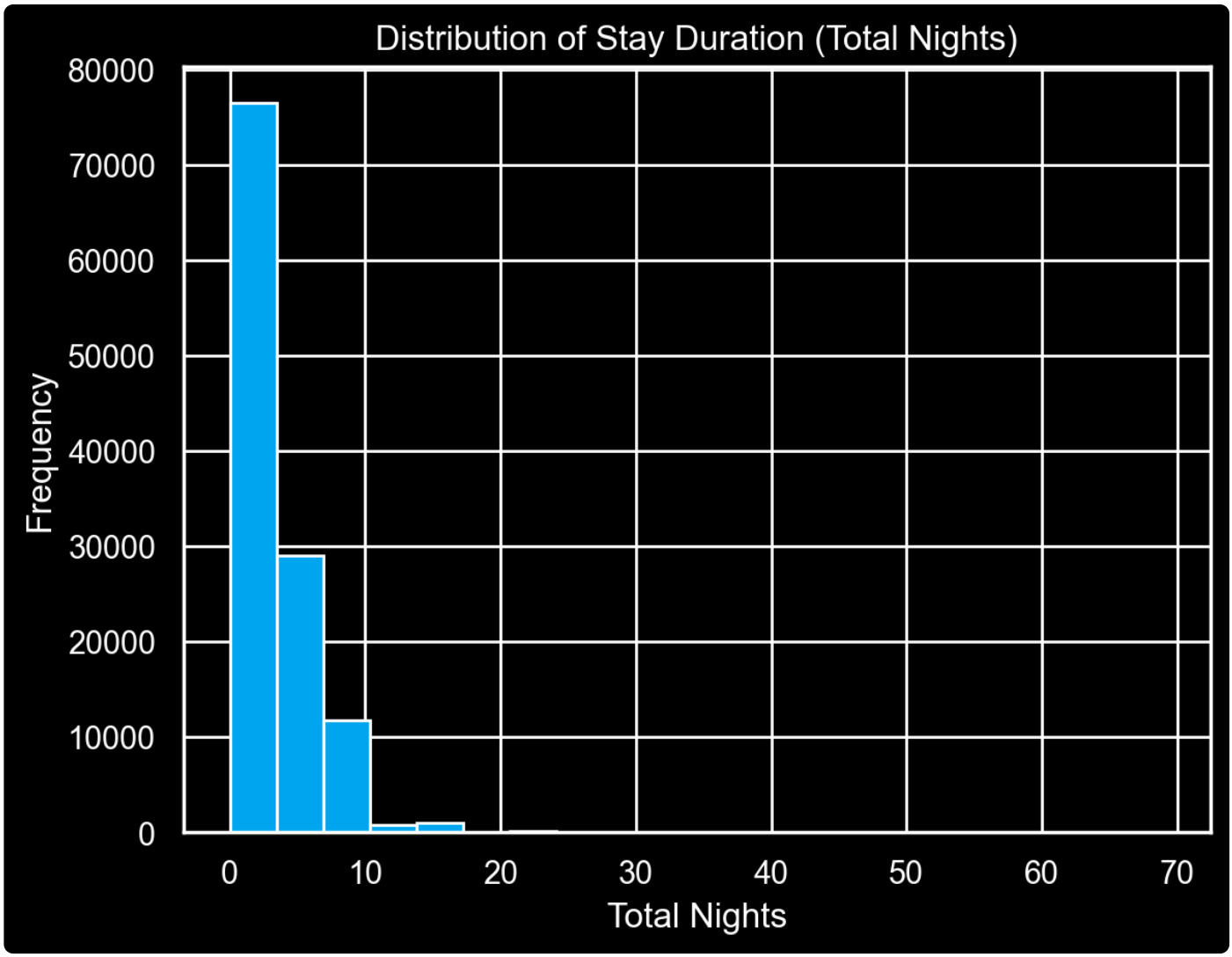
2. Average Daily Rate (ADR) by Hotel Type



3. Most Common Market Segments

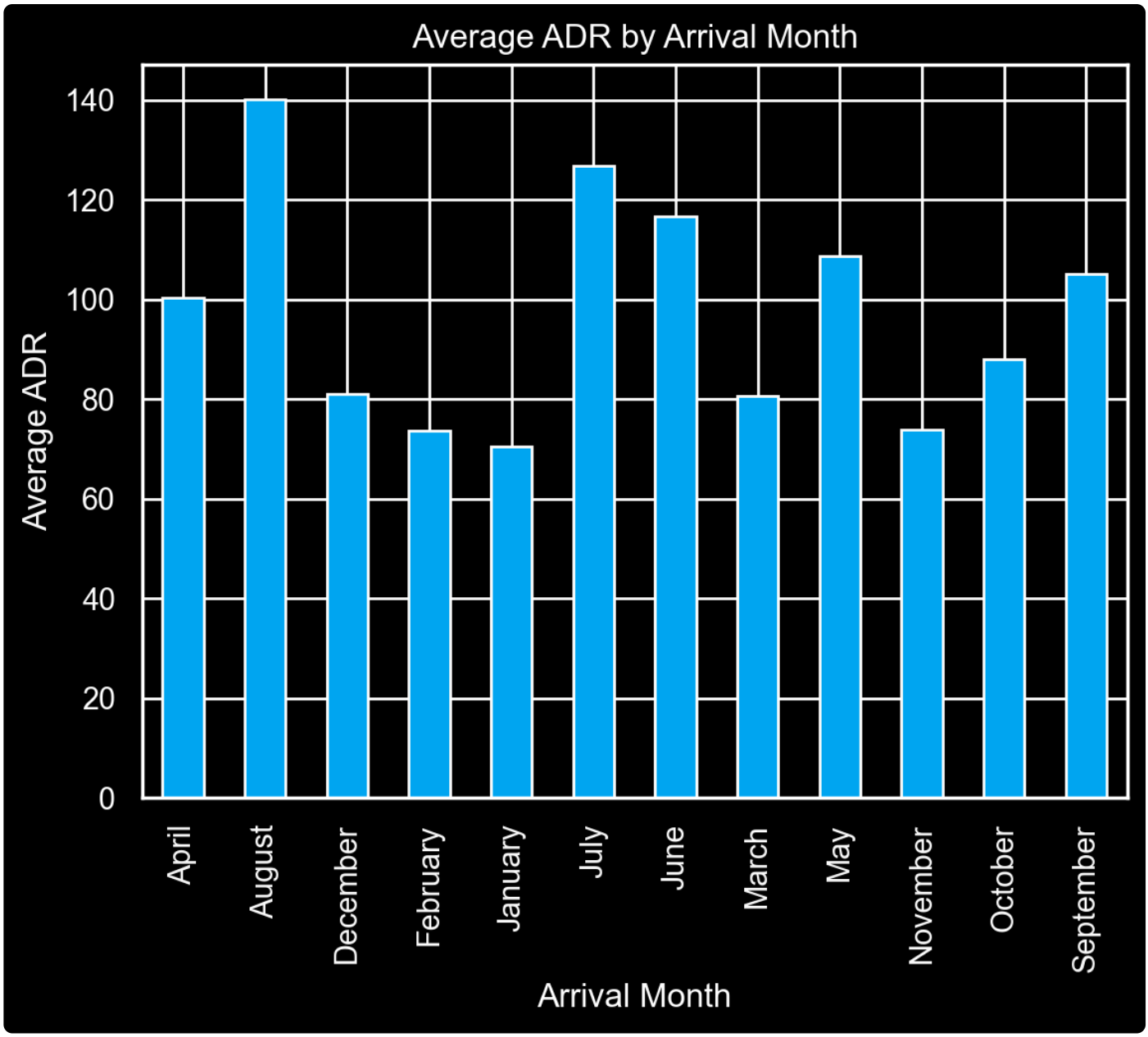


4. Distribution of Stay Duration (Total Nights)

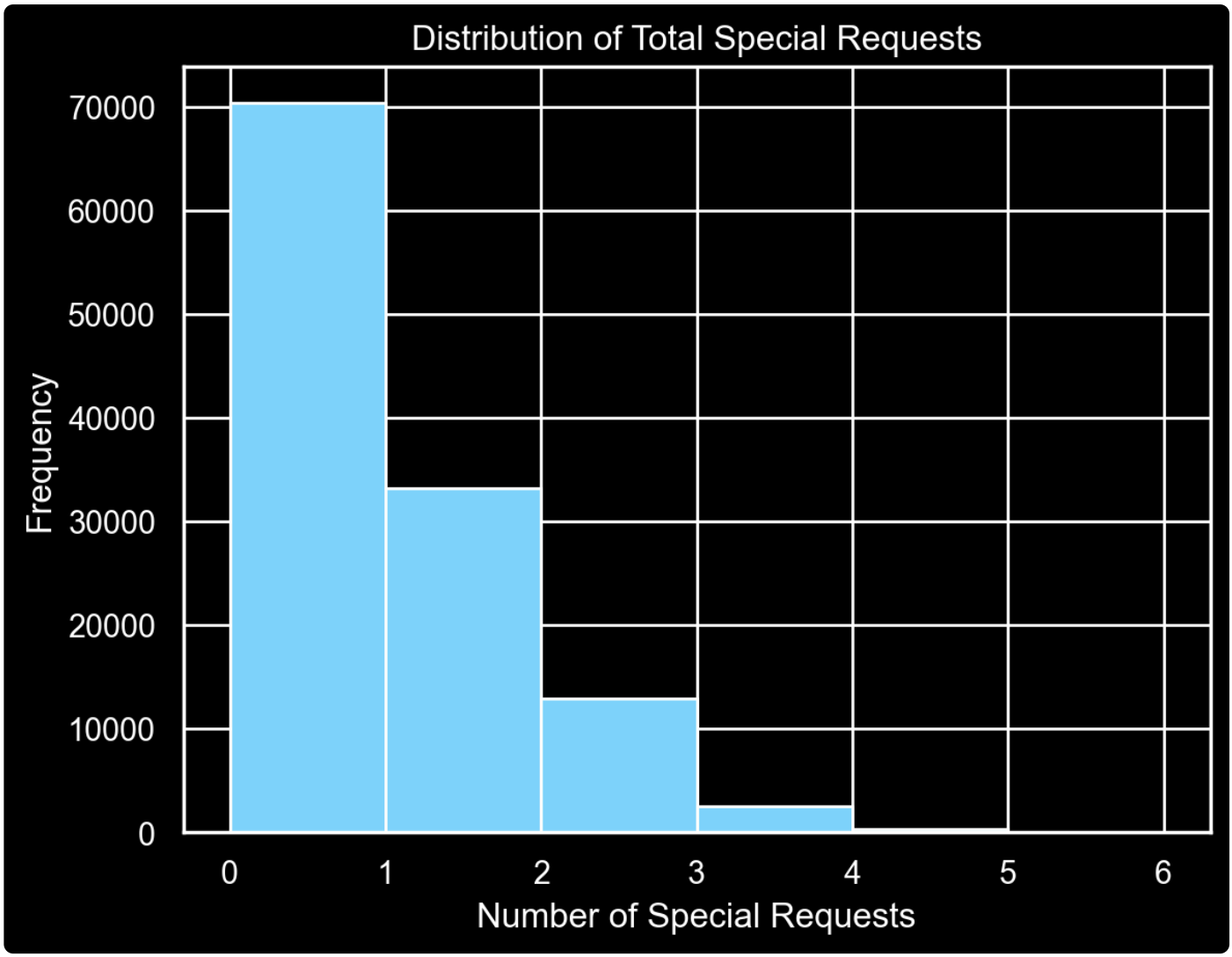


5. Cancellations Distribution

6. Average ADR by Arrival Month



7. Distribution of Total Special Requests

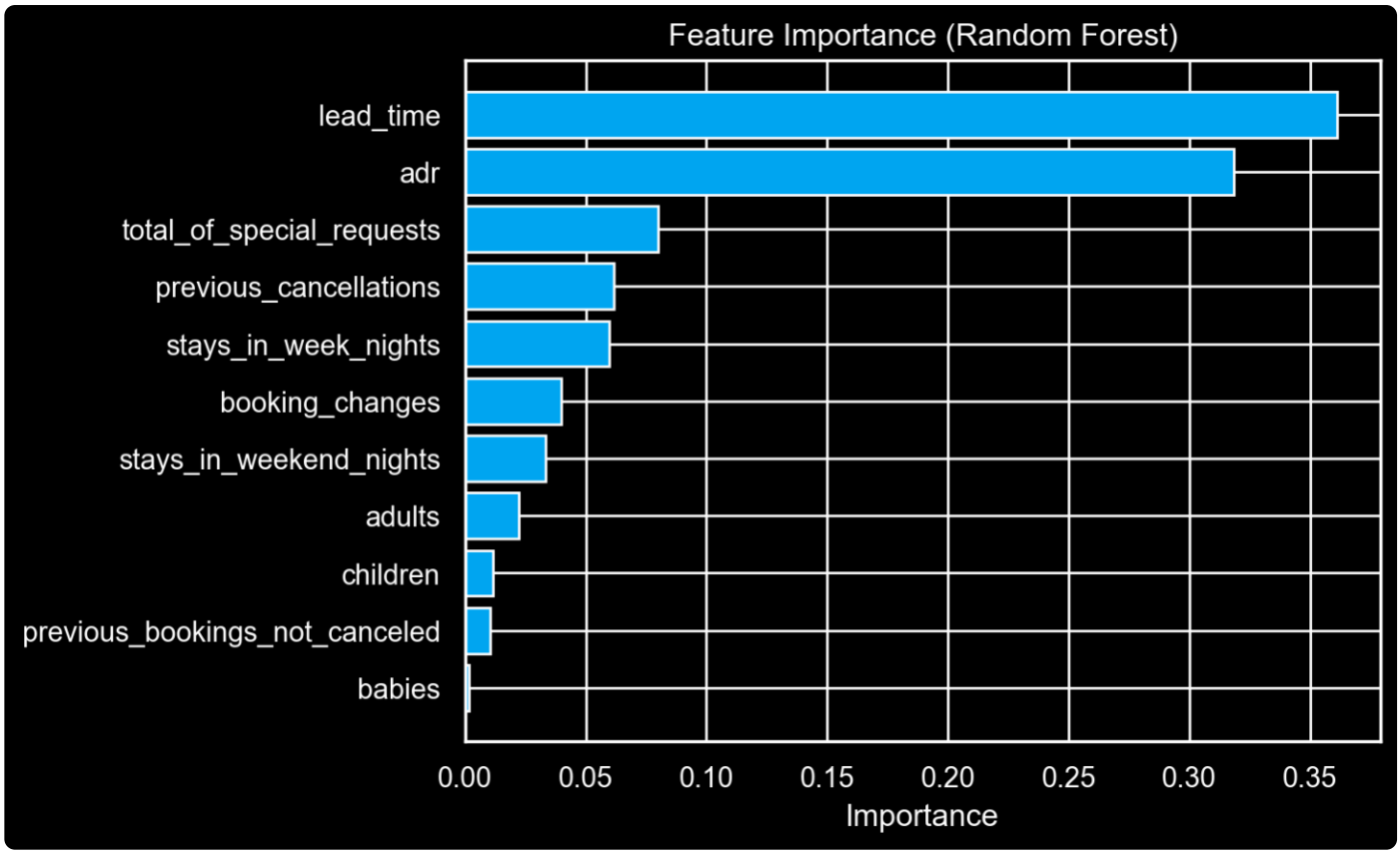


Machine Learning Model (Random Forest)

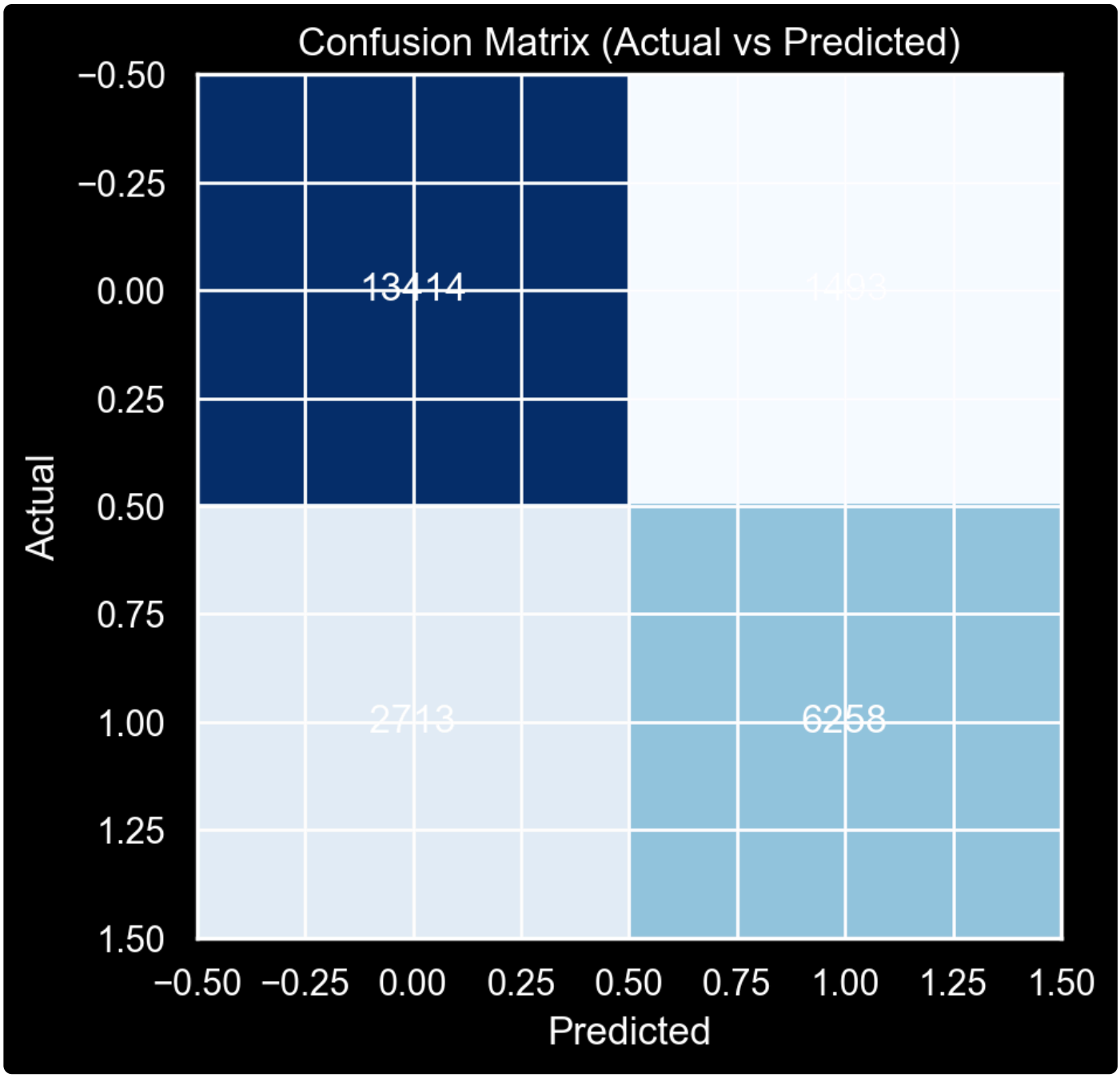
Model Results

Accuracy	Precision	Recall	F1 Score
82.39%	0.81	0.70	0.75

Feature Importance



Confusion Matrix



📋 Classification Report

	precision	recall	f1-score	support
0	0.832	0.900	0.864	14907
1	0.807	0.698	0.748	8971
accuracy			0.824	23878
macro avg	0.820	0.799	0.806	23878
weighted avg	0.823	0.824	0.821	23878

💡 Insights & Conclusion

The Random Forest model achieved strong predictive performance.

*Lead time, **ADR, and *Special Requests* were highly important.

Hotels can use this model to reduce cancellations and improve efficiency.

🔮 Booking Cancellation Prediction

Use the form below to simulate a booking and predict cancellation.

📋 Enter Booking Details

Lead Time (days): 50	Adults: 2	Previous Cancellations: 0
ADR: 100.00	Children: 0	Previous Non-Cancelled: 1
Weekend Nights: 2	Babies: 0	Special Requests: 1
Week Nights: 3	Booking Changes: 0	

🚀 Predict Booking Status

✅ Booking Confirmed | Confidence: 96.00%

✅ Project successfully completed with excellent results!

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